Case Study: Analysing Daily Exercise Data

1. **Business task:** Enhancing Member Experience and Optimizing Operations

Objective: To improve member satisfaction and retention, increase operational efficiency, and drive business growth through data-driven insights.

Key Goals:

I. Improve Member Engagement:
    - Understand member preferences and behaviour to tailor offerings.
    - Enhance the overall gym experience through personalized services.
II. Optimize Resources Allocation:
    - Efficiently manage gym space, equipment, and staff.
    - Schedule classes and maintenance during non-peak hours to minimize disruption.
III. Increase Member Retention:
    - Identify factors contributing to member churn.
    - Develop targeted retention strategies and loyalty programs.
IV. Identify opportunities for upselling and cross-selling services
    - Evaluate staff performance based on member feedback and operational metrics.
    - Optimize staff schedules to match member needs and peak times.
V. Health and Fitness Tracking:
    - Offer tools and programs for members to track their fitness progress.
    - Analyse aggregate health data to understand the effectiveness of programs.

2. **Identification of Data Set:**
   Data Set Requirement: The Data set consists of 8 columns (Headers), which Includes
   Member ID
   Date
   Time
   Types of Exercise
   Duration of Exercise (in Minutes)
   Age and Gender.
   The data set used for the Scenario is shown below.

   The Source is from Gym Entry System log.

Member ID	Date and Time of Visit	Date	Time	Type of Exercise	Duration of Exercise (minutes)	Age	Gender
1	1/1/2024 7:30	1/1/2024	7:30:00 AM	Cardio	45	25	Male
2	1/1/2024 8:00	1/1/2024	8:00:00 AM	Weightlifting	60	30	Female
3	1/1/2024 9:00	1/1/2024	9:00:00 AM	Yoga	30	22	Female
4	1/1/2024 10:00	1/1/2024	10:00:00 AM	Cardio	50	28	Male
5	1/1/2024 11:00	1/1/2024	11:00:00 AM	Weightlifting	55	35	Male
6	1/1/2024 12:00	1/1/2024	12:00:00 PM	Yoga	40	27	Female
7	1/2/2024 7:30	1/2/2024	7:30:00 AM	Cardio	45	23	Female
8	1/2/2024 8:00	1/2/2024	8:00:00 AM	Weightlifting	60	32	Male

| 9 | 1/2/2024 9:00 | 1/2/2024 | 9:00:00 AM | Yoga | 30 | 29 | Male |
| 10 | 1/2/2024 10:00 | 1/2/2024 | 10:00:00 AM | Cardio | 50 | 26 | Female |

3. **The Data integrity is attained by ensuring that:**
   - There is no duplicate entry
   - Standardize date and time formats.
   - Verification of membership demographics for accuracy.

4. **Data Analysis:**
   i. **Descriptive Statistics:**
   - Average Exercise duration is 46.5 Minutes
   - Most popular type of exercise: Cardio (41% of visits)

   ii. **Trend Analysis**
   - The Peak time for gym attendance: 7:30 AM to 11:00 AM

   iii. **Clustering:**
   - Segment 1: Young people (ages 23-28) prefer cardio
   - Segment 2: Older people (ages 30-35) prefer weightlifting
   - Segment 3: Young people (ages 22-29) prefer Yoga

5. **Visualization:**
   - The Bar Chart below depicts the type of exercises, the gender on the X axis (horizontal axis), while the duration is on the Y axis (Vertical axis)
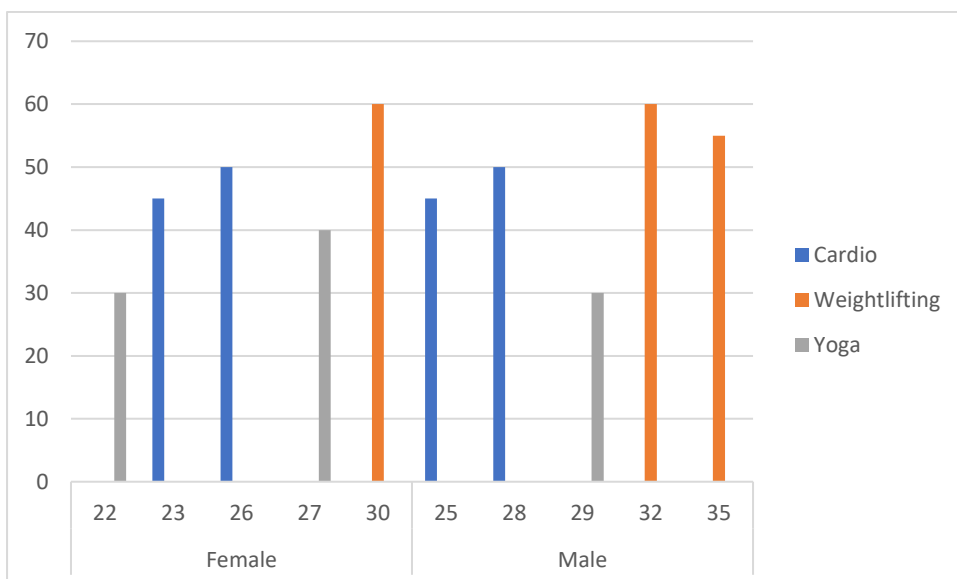
Gender/Age		Cardio	Weightlifting	Yoga	Grand Total
Female		**95**	**60**	**70**	**225**
22				30	30
23		45			45
26		50			50
27				40	40
30			60		60
Male		**95**	**115**	**30**	**240**
25		45			45
28		50			50
29				30	30
32			60		60
35			55		55
Grand Total		**190**	**175**	**100**	**465**

6. **Recommendation and Conclusion:**
   - It is recommended to invest more in the Cardio Exercise, since more people come for it and q=equally spend more time in the cardio.
   - The peak hour falls between 7:30 AM to 11:00 AM, so it is recommended to put more staff in order to match up with the peak hour.
   - Company might want to divest capital from yoga, since it has less people that show interest in it.